

**ULTRA-LOW POWER PROGRAMMABLE TIMER  
AND LOW VOLTAGE DETECTION CIRCUITS**

**ABSTRACT OF THE DISCLOSURE**

An Ultra-low power voltage detection circuit is implemented in a digital integrated circuit to device to provide a basic timer, programmable timer and programmable low voltage detection (PLVD) using a single connection of the digital integrated circuit device and a passive component(s) external to the digital integrated circuit device. An internal low current source may be enabled so as to discharge an external timing capacitor connected to the output connection, thus eliminating the need for an external resistor. However, timing accuracy may be improved by adding an external discharging resistor and/or charging resistor. The output connection may be configured as a tri-state output and may be driven high to charge and low to discharge the timing capacitor. A voltage reference may be used in determining a voltage trip point for timing and low voltage detection purposes. Temperature may be determined from either a trip voltage compared to a known voltage determined at a known temperature, or a current value of the current source compared to a known current value determined at a known temperature, times a constant.